

CLAIMS

1. A hydrogen-fueled internal combustion engine that operates upon receipt of one or two or more types of fuel that are selected from hydrogenated fuel and a dehydrogenated product and hydrogen, which dehydrogenated product and hydrogen are obtained by dehydrogenating the hydrogenated fuel, the hydrogen-fueled internal combustion engine comprising:

a hydrogenated fuel storage section;

reaction means that includes a catalyst that is positioned to be heatable and dehydrogenates hydrogenated fuel, which is supplied from the hydrogenated fuel storage section, on the catalyst that is heated;

separation means for separating hydrogen-rich gas and a dehydrogenated product that are derived from dehydrogenation; and

a dehydrogenated product storage section for storing the separated dehydrogenated product.

2. The hydrogen-fueled internal combustion engine according to claim 1, further comprising fuel supply means for arbitrarily selecting one or more types of fuel from among the hydrogenated fuel stored in the hydrogenated fuel storage section, the hydrogen-rich gas separated by the separation means, and the dehydrogenated product stored in

the dehydrogenated product storage section, and supplying the selected types of fuel to the internal combustion engine.

3. The hydrogen-fueled internal combustion engine
5 according to claim 1 or 2, wherein a honeycomb carrier is used as a catalyst carrier.

4. The hydrogen-fueled internal combustion engine
according to claim 3, wherein the honeycomb carrier has 45
10 to 310 cells/cm² and functions as a catalyst carrier whose ratio between the organic hydride inlet diameter and depth (diameter/depth) ranges from 0.1 to 0.5.

5. The hydrogen-fueled internal combustion engine
15 according to any one of claims 1 to 4, wherein the hydrogenated fuel storage section and the dehydrogenated product storage section are both made of an elastic resin material.

20 6. A hydrogen-fueled internal combustion engine comprising:

a hydrogenated gasoline tank for storing hydrogenated gasoline containing an organic hydride;

fuel separation means for separating the
25 hydrogenated gasoline into hydrogen-rich gas and dehydrogenated gasoline; and

fuel supply means for supplying at least the hydrogen-rich gas and/or the dehydrogenated gasoline on an individual basis or simultaneously, among the hydrogenated gasoline, the hydrogen-rich gas, and the dehydrogenated gasoline, to the internal combustion engine as fuel.

7. The hydrogen-fueled internal combustion engine according to claim 6, wherein the fuel supply means comprises:

hydrogenated gasoline supply means for supplying the hydrogenated gasoline to the internal combustion engine;

hydrogen-rich gas supply means for supplying the hydrogen-rich gas to the internal combustion engine;

dehydrogenated gasoline supply means for supplying the dehydrogenated gasoline to the internal combustion engine;

fuel selection means for selecting one or more types of fuel from the hydrogenated gasoline, the hydrogen-rich gas, and the dehydrogenated gasoline; and

fuel supply control means for controlling the hydrogenated gasoline supply means, the hydrogen-rich gas supply means, and the dehydrogenated gasoline supply means so that the selected types of fuel are supplied to the internal combustion engine.

8. The hydrogen-fueled internal combustion engine

according to claim 7, further comprising:

gasoline necessity judgment means for judging whether the supply of gasoline is necessary; and

dehydrogenated gasoline supply judgment means for
5 judging whether the dehydrogenated gasoline can be supplied,

wherein the fuel supply control means allows the hydrogenated gasoline to be supplied to the internal combustion engine only when the necessity for gasoline
10 supply is recognized and the dehydrogenated gasoline cannot be supplied.

9. The hydrogen-fueled internal combustion engine according to claim 8, further comprising:

15 hydrogen-rich gas supply judgment means for judging whether the hydrogen-rich gas can be supplied,

wherein, when the hydrogen-rich gas and the dehydrogenated gasoline can both be supplied, the fuel supply control means constantly supplies a combination of
20 the hydrogen-rich gas and the dehydrogenated gasoline to the internal combustion engine as fuel.

10. The hydrogen-fueled internal combustion engine according to claim 6, wherein the fuel supply means
25 comprises:

hydrogen-rich gas supply means for supplying the

hydrogen-rich gas to the internal combustion engine;

dehydrogenated gasoline supply means for supplying the dehydrogenated gasoline to the internal combustion engine;

5 fuel selection means for selecting one or more types of fuel from the hydrogen-rich gas and the dehydrogenated gasoline; and

fuel supply control means for controlling the hydrogen-rich gas supply means and the dehydrogenated gasoline supply means so that the selected types of fuel
10 are supplied to the internal combustion engine.

11. The hydrogen-fueled internal combustion engine according to claim 10, further comprising:

15 a hydrogen-rich gas tank for storing the hydrogen-rich gas; and

hydrogen-rich gas remaining amount judgment means for judging whether a permissible supply amount is exceeded by the remaining amount of the hydrogen-rich gas,

20 wherein the fuel supply control means includes fuel supply amount calculation means for calculating the dehydrogenated gasoline supply amount on the assumption that only the dehydrogenated gasoline is supplied to the internal combustion engine, and, when the permissible
25 supply amount is not exceeded by the remaining amount of the hydrogen-rich gas, supplies only the dehydrogenated

gasoline to the internal combustion engine in accordance with a fuel supply amount that is calculated by the fuel supply amount calculation means.

5 12. The hydrogen-fueled internal combustion engine according to claim 10 or 11, further comprising:

 a dehydrogenated gasoline tank for storing the dehydrogenated gasoline; and

 dehydrogenated gasoline remaining amount judgment
10 means for judging whether an upper-limit storage amount is reached by the remaining amount of the dehydrogenated gasoline,

 wherein the fuel separation means performs a process for separating the hydrogenated gasoline into the
15 hydrogen-rich gas and the dehydrogenated gasoline in such a manner as to compensate for the amount of hydrogen-rich gas consumption; and

 wherein the fuel supply control means supplies only the dehydrogenated gasoline to the internal combustion
20 engine in a situation where the upper-limit storage amount is reached by the remaining amount of the dehydrogenated gasoline.